

We claim:

1. An apparatus for determining tampering in an electricity meter arrangement comprising:

a service disconnect switch operable to controllably disconnect electrical power lines from a load, the load including at least first and second feeder lines;

a voltage sense circuit coupled to sense voltage on the first and second feeder lines, the voltage sense circuit operable to generate a voltage detection signal based on a first voltage on the first feeder line and a second voltage on the second feeder line, the voltage detection signal having a characteristic representative of whether line voltage from the electrical power lines is present on the first and second feeder lines; and

a processing circuit operably connected to the voltage sense circuit to receive the voltage detection signal, the processing circuit operable to selectively generate a tamper flag based on whether the characteristic of the voltage detection signal indicates the presence of voltage on the first and second feeder lines when the service disconnect switch has disconnected the electrical power lines from the first and second feeder lines.

2. The apparatus of claim 1 wherein the voltage sense circuit is further operable to generate a voltage detection signal having a first magnitude when line voltage is present on the first and second feeder lines and having a second magnitude when line voltage is not present on the first and second feeder lines.

3. The apparatus of claim 2 wherein the first magnitude and second magnitude are discrete digital signal levels.
4. The apparatus of claim 1 wherein the voltage sense circuit includes a voltage divider operable to scale a voltage difference between the first feeder line and the second feeder line.
5. The apparatus of claim 4 wherein:
 - the voltage sense circuit further includes an output switch;
 - the voltage divider includes an output coupled to an output switch, the output switch biased on the voltage divider provides a voltage exceeding a predetermined level, the output switch operably coupled to provide the voltage detection signal to the processing device, the voltage detection signal varying based on whether the output switch is biased on.
6. The apparatus of claim 5 wherein the output switch is coupled to the voltage divider output through an optical isolator.
7. The apparatus of claim 5 wherein the processing circuit is further operable to obtain digital values from a meter measurement circuit and generate metering information therefrom.

8. The apparatus of claim 1 wherein the voltage sense circuit includes an output switch, the output switch biased on when line voltage is present on the first and second feeder lines, the output switch operably coupled to provide the voltage detection signal to the processing device, the voltage detection signal varying based on whether the output switch is biased on.

9. The apparatus of claim 1 wherein the voltage sense circuit further includes an isolation mechanism, said isolation mechanism isolating the processing circuit from the first and second feeder lines.

10. The apparatus of claim 1 wherein the voltage sense circuit includes an optical isolation circuit.

11. An apparatus for determining tampering in an electricity meter arrangement comprising:

- a housing containing a metering circuit;
- a service disconnect switch disposed within the housing, the service disconnect switch operable to controllably disconnect electrical power lines from a load, the load including at least first and second feeder lines;
- a voltage sense circuit coupled to sense voltage on at least one feeder line, the voltage sense circuit including an isolation mechanism interposed between the at least one feeder line and an output, the voltage sense circuit operable to generate a voltage detection signal having a characteristic representative of whether line voltage from the electrical power lines is present

on the at least one feeder line, the voltage sense circuit operable to provide the voltage detection signal to the output; and

a processing circuit operably connected to the output to receive the voltage detection signal, the processing circuit operable to selectively generate a tamper flag based on whether the characteristic of the voltage detection signal indicates the presence of voltage on the at least one feeder line when the service disconnect switch has disconnected the electrical power lines from the first and second feeder lines.

12. The apparatus of claim 11 wherein the voltage sense circuit is further operable to generate a voltage detection signal having a first magnitude when line voltage is present on the at least one feeder line and having a second magnitude when line voltage is not present on at least one feeder line.
13. The apparatus of claim 12 wherein the first magnitude and second magnitude are discrete digital signal levels.
14. The apparatus of claim 1 wherein the voltage sense circuit includes an output switch, the output switch biased on when line voltage is present on the at least one feeder line, the output switch operably coupled to provide the voltage detection signal to the output, the voltage detection signal varying based on whether the output switch is biased on.

15. The apparatus of claim 14 wherein the output switch is an optical receiver, the optical receiver including a portion of the isolation mechanism.

16. The apparatus of claim 11 wherein the isolation mechanism includes an optical isolation circuit.

17. A method comprising:

- a) disconnecting, using a service disconnect switch, at least one feeder line of a load from at least one electrical power line, the service disconnect switch disposed within an electricity meter housing;
- b) employing a voltage sense circuit that is operably connected to the at least one power line to generate a voltage detection signal having a characteristic representative of whether line voltage from the electrical power lines is present on the at least one feeder line;
- c) providing the voltage detection signal to an output that is electrically isolated from the at least one feeder line;
- d) employing a processing circuit to receive the voltage detection signal and generate a tamper flag if the characteristic of the voltage detection signal indicates the presence of line voltage on the at least one feeder line.

18. The method of claim 17 wherein step b) further includes employing the voltage sense circuit to generate the voltage detection signal such that the voltage detection signal has a first magnitude when line voltage is present on the at least one feeder lines and the voltage detection signal has a second magnitude when line voltage is absent from the at least one feeder line.

19. The method of claim 18 wherein step b) further includes employing the voltage sense circuit to generate the voltage detection signal such that the first magnitude and the second magnitude are discrete digital voltage levels.

20. The method of claim 17 further including:

e) employing the processing circuit to perform a metering calculation.